

TASK 4 – PRELIMINARY SCREENING¹

This report describes the preliminary screening results for proposed methodologies listed under task 3 using the criteria and scoring system developed in task 2. In addition, an explanation for the scores and basis for acceptance or rejection of a methodology are included. Accepted methodologies will undergo a secondary evaluation.

In the following table, the first column lists methodologies identified for consideration during task 3. Key words identify evaluation categories in subsequent columns. See the task 2 report for a full description of each category.

Methodology	Category 1 - Applicability	Category 2 - Availability	Category 3 - Portability	Category 4 - Data Needs	Category 5 - Ease of Use	Total Score
CREAMS-WT	5	5	5	4	4	23
FHANTM	3	5	5	3	3	19
FHANTM - 2	4	5	5	3	2	19
EAAMOD-OKEE	3	3	4	2	2	14
Florida Phosphorus Index	2	5	5	3	4	19
Phosphorus Budgets	4	5	5	4	4	22

CREAMS-WT

Category 1: A score of 5 was assigned because the methodology was principally developed for use in the Lake Okeechobee watershed, with the intent of examining land use change impacts on nutrient loading to the lake. The methodology is well documented and underwent an extensive peer review process. It has been used by the District for various projects over the last decade.

Category 2: A score of 5 was assigned because CREAMS-WT is in the public domain and can be obtained at no charge from the District or University of Florida (agricultural sciences) website.

Category 3: A score of 5 was assigned because the methodology can be run on any personal computer, and does not require a special operating system or additional software.

Category 4: A score of 4 was assigned, because the methodology has been applied and tested in the Lake Okeechobee watershed. A majority of data required by the model (i.e. soils, land use, weather) has been assembled by District staff. However, there is still a need for additional information about individual land parcel and management practices that users must provide.

Category 5: A score of 4 was assigned, because most input data is available from past model applications. Approximately one day is required to set-up and run the model, and analyze its results.

¹ This report is based on a memorandum submitted as the task 4 project deliverable by R. Srinivasan.

FHANTM

Category 1: A score of 3 was assigned, because FHANTM was developed to estimate edge-of-field phosphorus loads in the Lake Okeechobee watershed. The methodology was tested with various datasets collected in the field and has gone through a peer review process. However, the model has limitations with regard to BMPs involving manure application.

Category 2: A score of 5 was assigned, because the methodology is in the public domain and can be obtained at no charge from the District or University of Florida (agricultural sciences) website.

Category 3: A score of 5 was assigned, because the methodology can be executed on any personal computer and does not require a special operating system or additional software.

Category 4: A score of 3 was assigned because the methodology has been applied and tested in the Lake Okeechobee watershed. A majority of data required by the model (i.e. soils, land use, weather) was assembled by District staff. However, the FHANTM model is based on physical parameters, which require additional information about individual land parcels that the user must provide.

Category 5: A score of 3 was assigned because most input data is available from past model applications. However, approximately two to three days are required to set-up and run the model and analyze results.

FHANTM – 2

Category 1: A score of 4 was assigned, because FHANTM-2 was developed to overcome BMP limitations in FHANTM. The methodology was tested with datasets collected from the Lake Okeechobee watershed and has gone through a peer review process. FHANTM-2 has shown improved predictive performance over FHANTM.

Category 2: A score of 5 was assigned, because the methodology is in the public domain and can be obtained at no charge from the District or University of Florida (agricultural sciences) website.

Category 3: A score of 5 was assigned, because the methodology can be executed on any personal computer and does not require a special operating system or additional software.

Category 4: A score of 3 was assigned, because the methodology has been applied and tested in the Lake Okeechobee watershed. A majority of data required by the model (i.e. soils, land use, weather) was assembled by District staff. However, the FHANTM-2 model is based on physical parameters which require additional information about individual land parcels that the user must collect and provide. In addition, only a limited number of stocking densities can be specified for pastures.

Category 5: A score of 3 was assigned because most input data is available from past model applications. However, two to three days are required to set-up and run the model and analyze results.

EAAMOD-OKEE

Category 1: A score of 3 was assigned, because EAAMOD-OKEE was developed primarily for the Everglades Agricultural Area (EAA), south of Lake Okeechobee. The methodology has been tested in the Lake Okeechobee watershed, but most testing has not been reported in the peer reviewed literature.

Category 2: A score of 3 was assigned, because the methodology is not in public domain and can be obtained at a cost only from its developers.

Category 3: A score of 4 was assigned, because the methodology can be executed on any personal computer and does not require a special operating system. However the model's GUI was written in Visual Basic. If an interpreter is needed to execute the Visual Basic code, an added cost may be incurred.

Category 4: A score of 2 was assigned, because the methodology has mainly been applied outside of the Lake Okeechobee watershed. Hence, input data sets need to be developed for most areas of the watershed.

Category 5: A score of 2 was assigned, because input data sets are complex and need to be developed for the watershed. Approximately one week is required to set-up and run the model and analyze the results.

Florida Phosphorus Index

Category 1: A score of 2 was assigned. Although the Florida Phosphorus Index was developed to evaluate the impact of land use and BMPs on phosphorus loads leaving a field, its documentation specifically states that the methodology should not be used as a regulatory tool. The National Resource Conservation Service (NRCS) has evaluated the phosphorus index for some land uses in the Lake Okeechobee watershed, and their work currently is undergoing peer review. The NRCS found this methodology is insensitive to conditions in the watershed, due to the small amount of soil erosion that occurs. Although adaptable to watershed conditions, the phosphorus index will require significant modification for use as a regulatory tool.

Category 2: A score 5 was assigned, because the methodology is in the public domain and can be accessed at no charge through the USDA-NRCS website.

Category 3: A score of 5 was assigned, because the methodology does not require use of a computer. The methodology is applied by collecting data specific to a particular field, using lookup tables, and applying standard procedures that have been developed by the NRCS.

Category 4: A score of 3 was assigned, because the methodology requires land use specific information not yet been developed by NRCS. The District may have some of this information, developed for use by other methodologies.

Category 5: A score of 4 was assigned, because the District and NRCS already have assembled data that may be used by the methodology. Approximately one day is required to apply the methodology and analyze results, if all required information is available.

Phosphorus Budgets

Category 1: A score of 4 was assigned, because the methodology is simple in concept and straight forward in use.

Category 2: A score of 5 was assigned, because the methodology is in public domain and will be obtainable from the District at minimal or no cost.

Category 3: A score of 5 was assigned, because the methodology does not require use of computer. The methodology is applied to a specific land use by obtaining relevant phosphorus import and export information. This information is input to simple mass balance equations.

Category 4: A score of 4 was assigned, because required information has been collected by other studies for most land uses in the Lake Okeechobee watershed. Additional information about some land uses still needs to be acquired by District staff.

Category 5: A score of 4 was assigned, because required input for most land uses is available. Less than a day should be needed to apply the methodology and analyze results, if all required input is available.

Recommendations

Based on the above results, most methodologies can determine the impacts that land use changes have on phosphorus loads leaving a land parcel. However, CREAMS-WT and the Phosphorus Budgets methodologies merit further examination based on total points awarded. Given its relative simplicity relative to other methodologies which received the same score, the Florida Phosphorus Index also should receive further consideration. Hence, the recommendation is made to examine these three methodologies under the secondary screening in task 5.